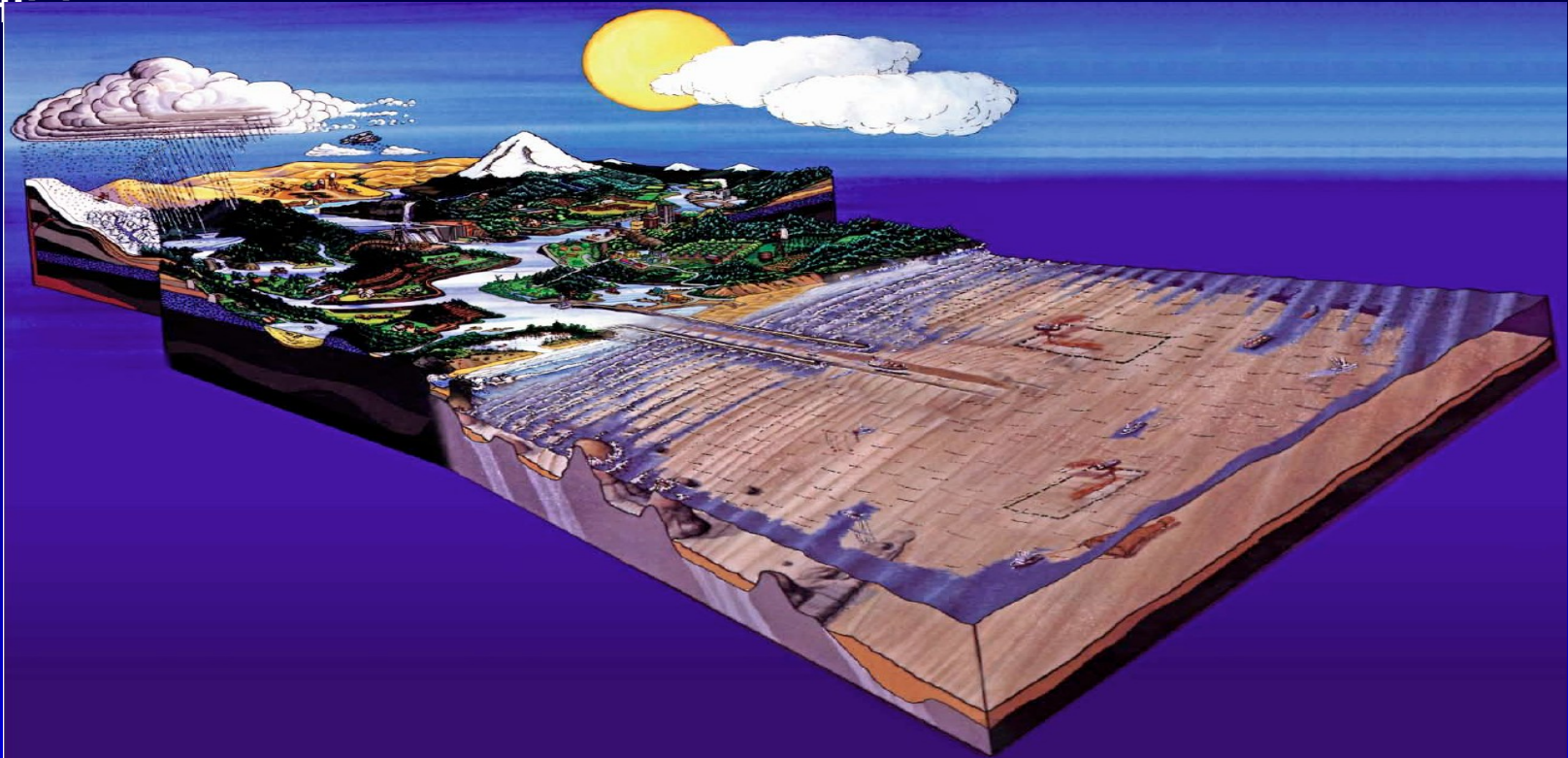


# Regional Sediment Management Program (RSM) in the Gulf of Mexico

## Objective

To improve sediment management practices within the Corps by demonstrating how to implement a system-based approach and how such an approach provides opportunities to achieve greater effectiveness and efficiency.



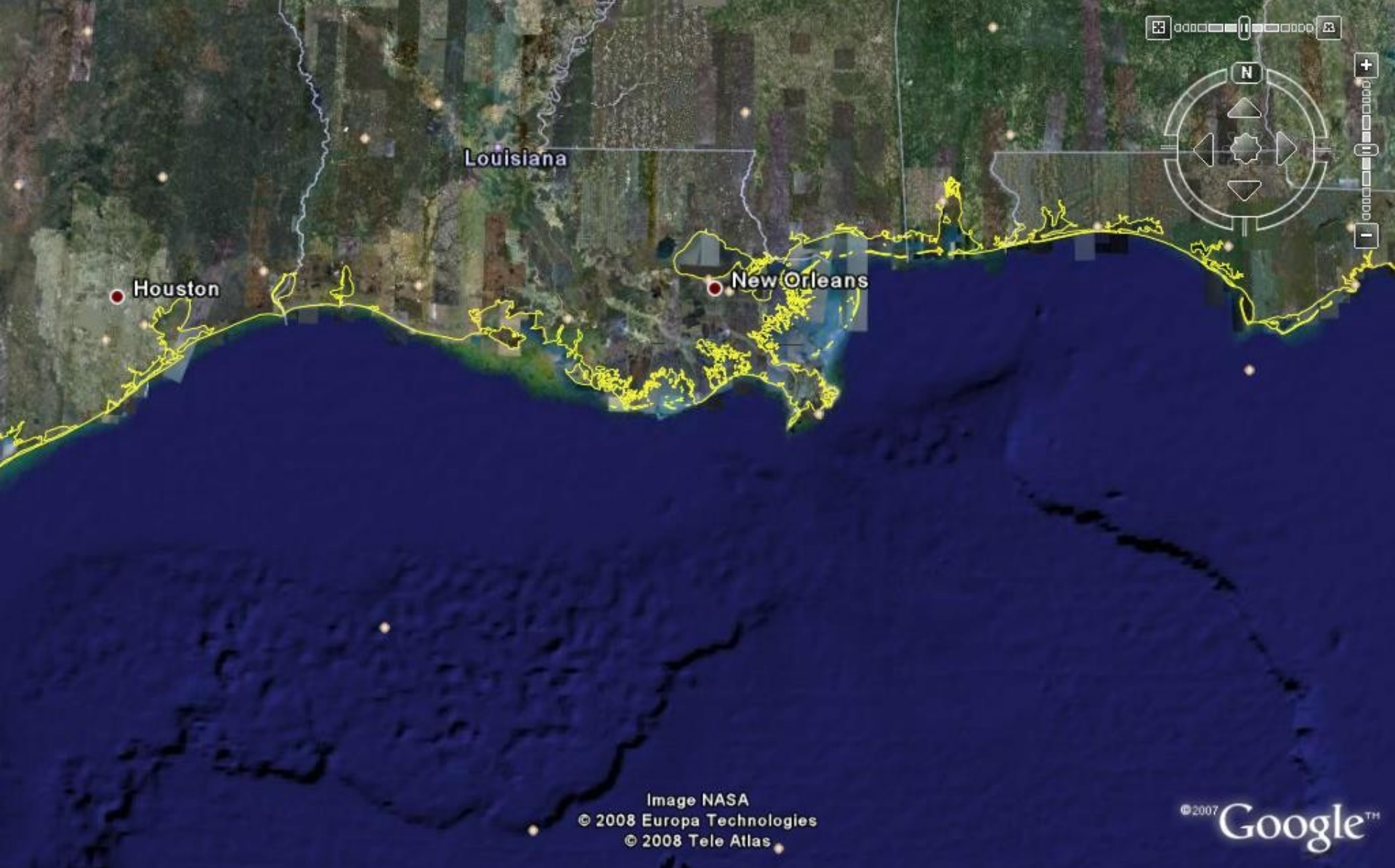
US Army Corps  
of Engineers

Engineer Research & Development  
Center

# RSM Approach

- **Recognizes Sediment as a Resource**
  - **Integral to economic and environmental vitality**
  - **Consider the multiple inter-related resource needs and opportunities**
- **Hydrologic System provides context for managing projects/activities involving sand & other sediments**
  - **Coastal, river and estuarine systems**
  - **Regional sediment transport dynamics - sources, sinks, spatial and temporal transport dynamics**
- **Uses**
  - **Knowledge about the sediment transport dynamics as context for local project decisions and consideration of long range implications**
  - **Partnerships across federal, state, ngo and private interests to balance objectives and leverage resources.**





Louisiana

Houston

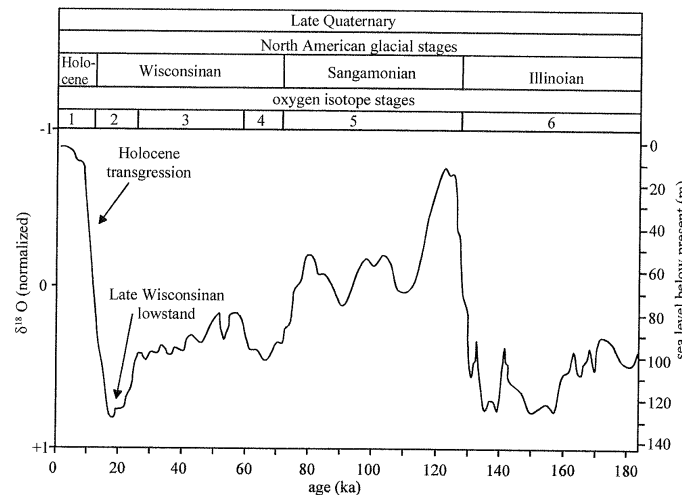
New Orleans

Image NASA  
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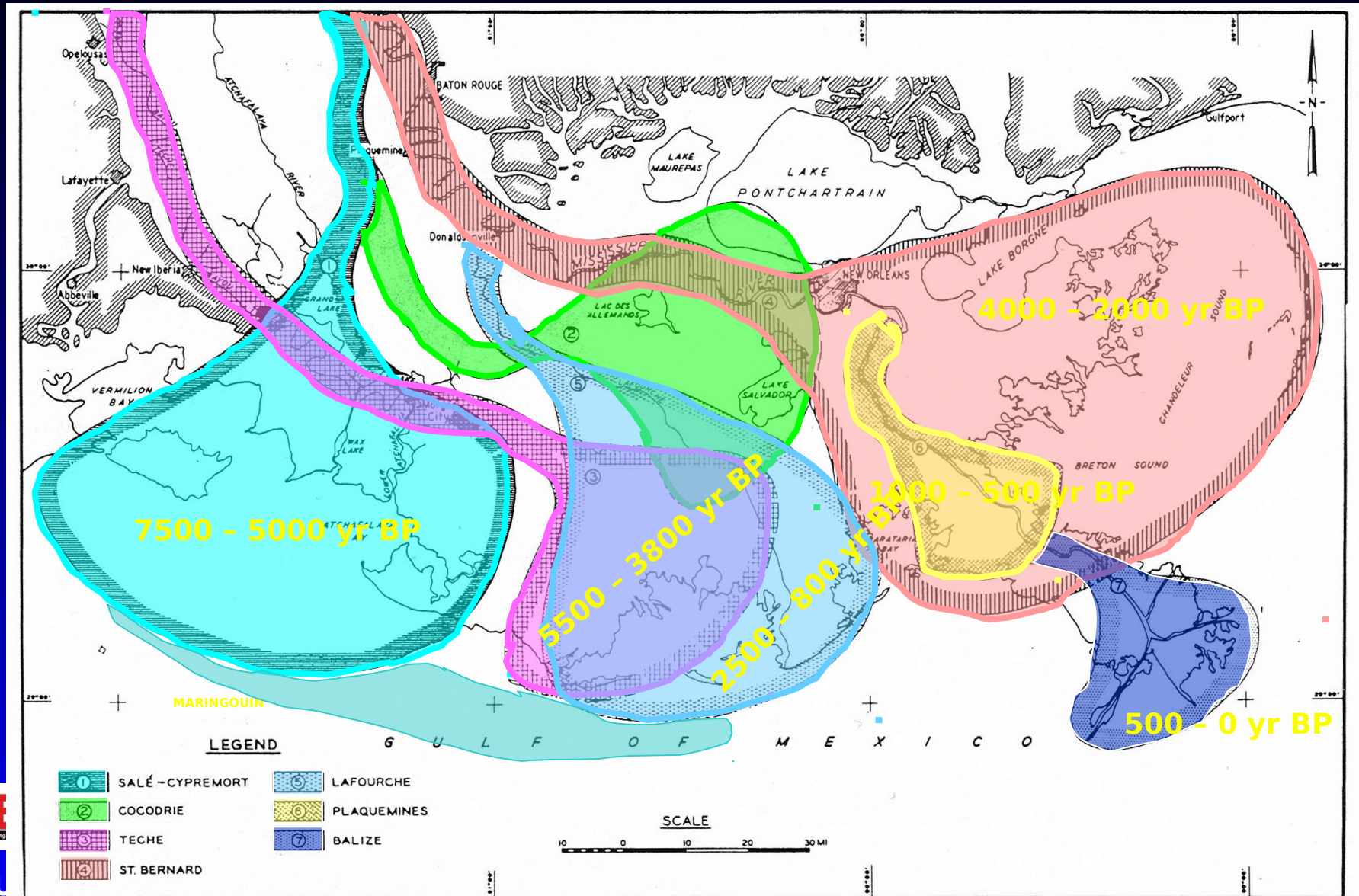
© 2007 Google™

# Controls on Coastal Geomorphic Evolution

- Framework Geology
- Energy Conditions - waves, tides, ocean currents, tropical storms
- Sediment Delivery - volume and physical properties



# Sequence of Holocene Mississippi Delta Complexes



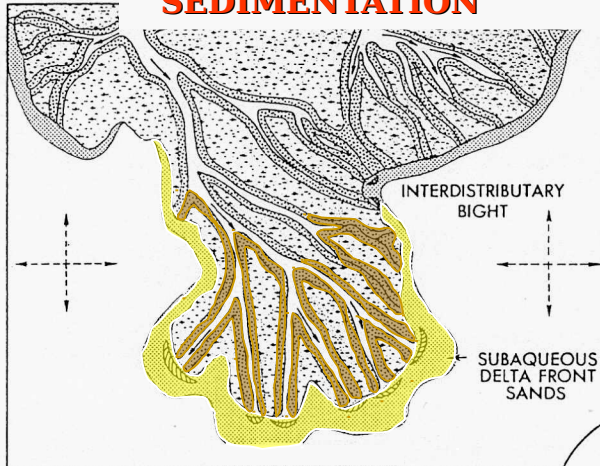
Chronologic sequence of Holocene Mississippi Delta lobes (from Kolb and Van Lopik, 1966; Fraiser, 1967).

Center

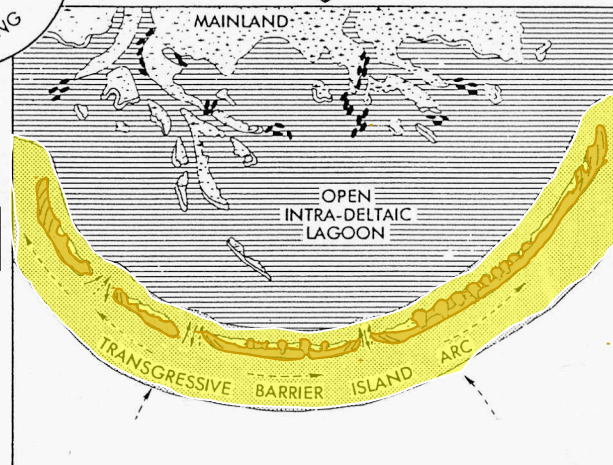
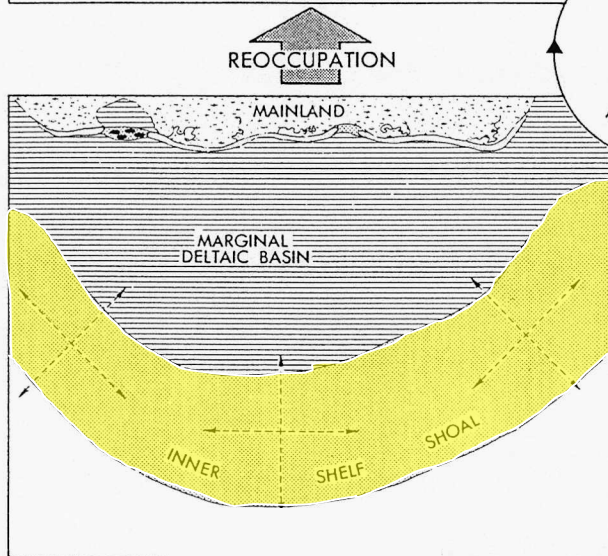
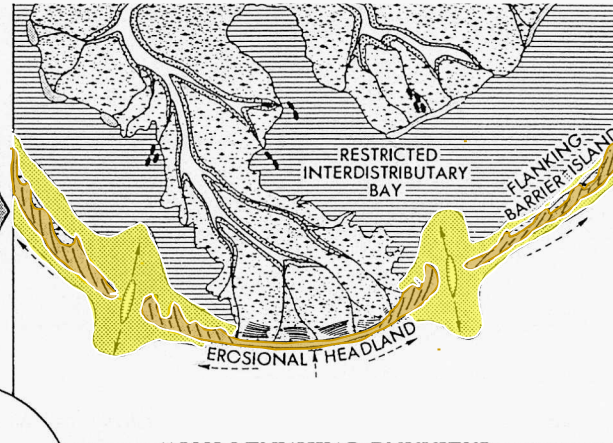
# Deltaic Evolutionary Stages

## Processes

### STAGE 1: ACTIVE DELTA/ SEDIMENTATION



### STAGE 2: EROSIONAL HEADLAND WITH FLANKING BARRIERS



SUBAQUEOUS REWORKED DELTAIC SANDS

SUBAERIAL REWORKED DELTAIC SANDS

MARSH

WAVE TIDE SEDIMENT DISPERSAL PATHS

DISTRIBUTARY LEVEE

A) Delta River Morphology Growth



B) Eroding Delta Headland forms flanking Barrier Is. & Spits



C) Transgressive Barrier Island Arc erosion



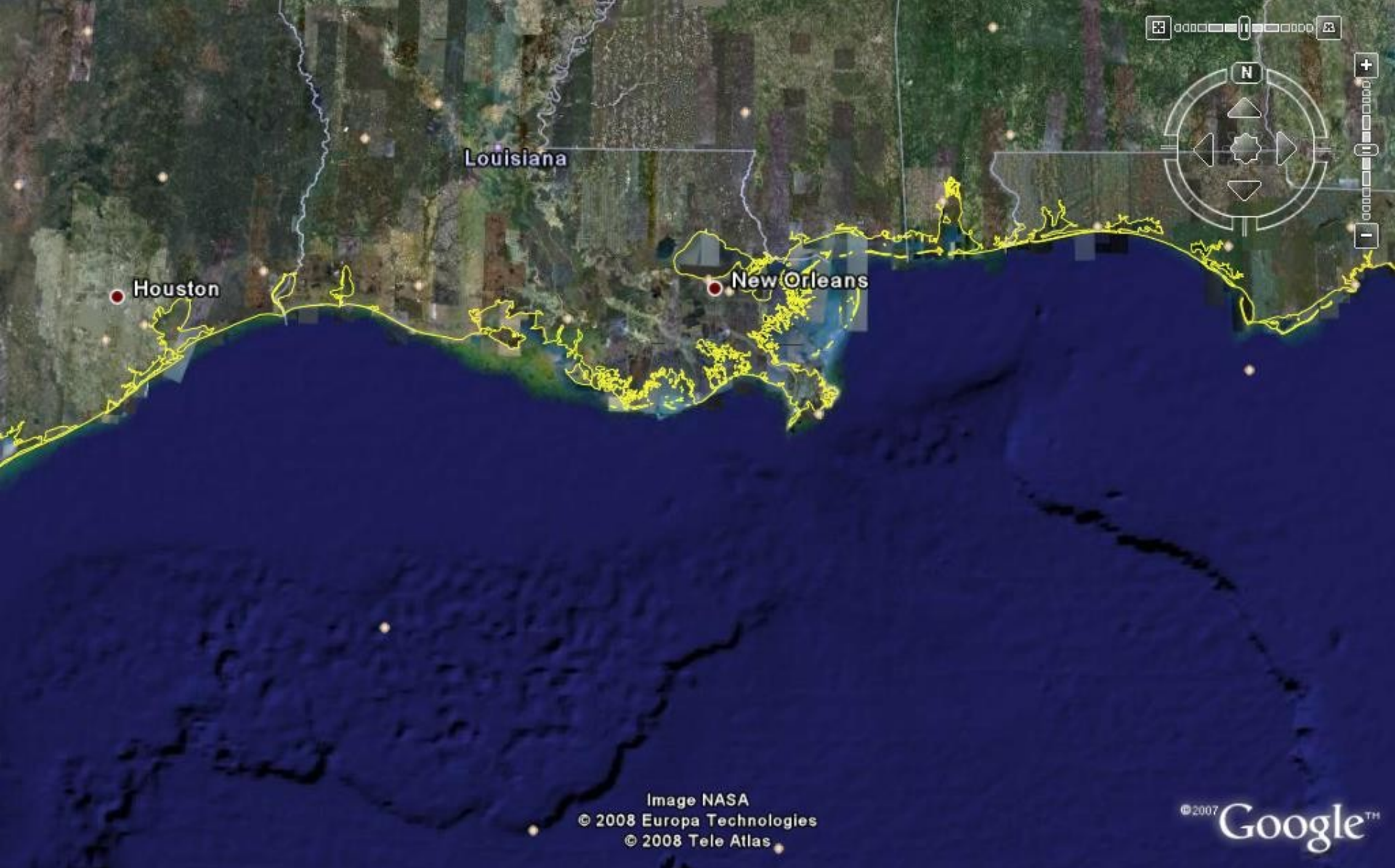
D) Loss of Barrier Island only Remnant Shoals left

US A **STAGE 4: INNER SHELF SHOAL**  
of Engineers

**STAGE 3:**  
**TRANSGRESSIVE**  
**BARRIER ISLAND ARC**

Center

& Development  
(Holland and Boyd, 1985)



Louisiana

Houston

New Orleans

Image NASA  
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Mississippi

Alabama

Mobile Bay

Biloxi

Bayou

La Batre

Gulfport

Pascagoula

Mississippi

Sound

GIWW

Cat Island

Ship Is. Pass

Ship Island

Dog Keys Pass

Horn Island

Horn Is. Pass

Petit Bois Island

Petit Bois Pass

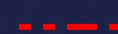
Dauphin Island



Area of Detailed Analysis



Area Considered for Regional Trends, Sources and Sinks



Navigation Channels

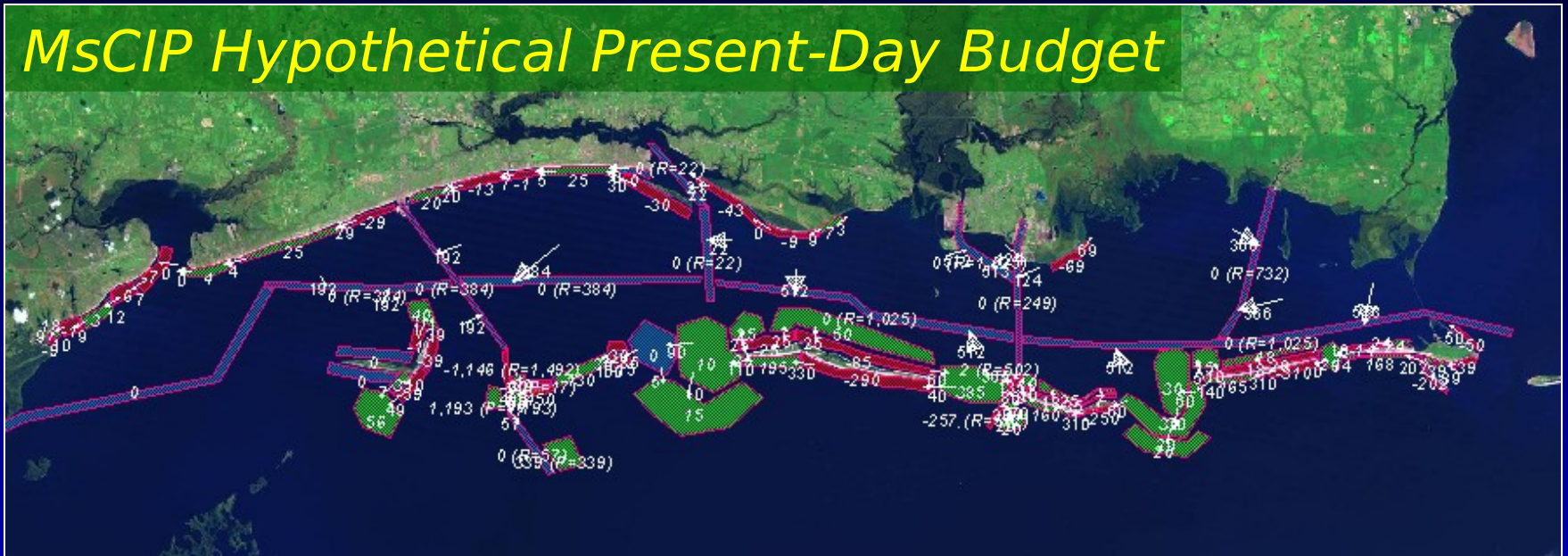


**Regional Sediment Budget: Provides a detailed accounting of sediment movement as a tool for evaluating present and future RSM activities and decisions.**

- Begins with understanding of sediment pathways —connections
- Complex hydrodynamic and sediment transport system
- Defensible, robust analysis with stakeholder buy-in
- Opportunity to show the benefits (economic and otherwise) of adopting an RSM approach

# Operational Sediment Budget

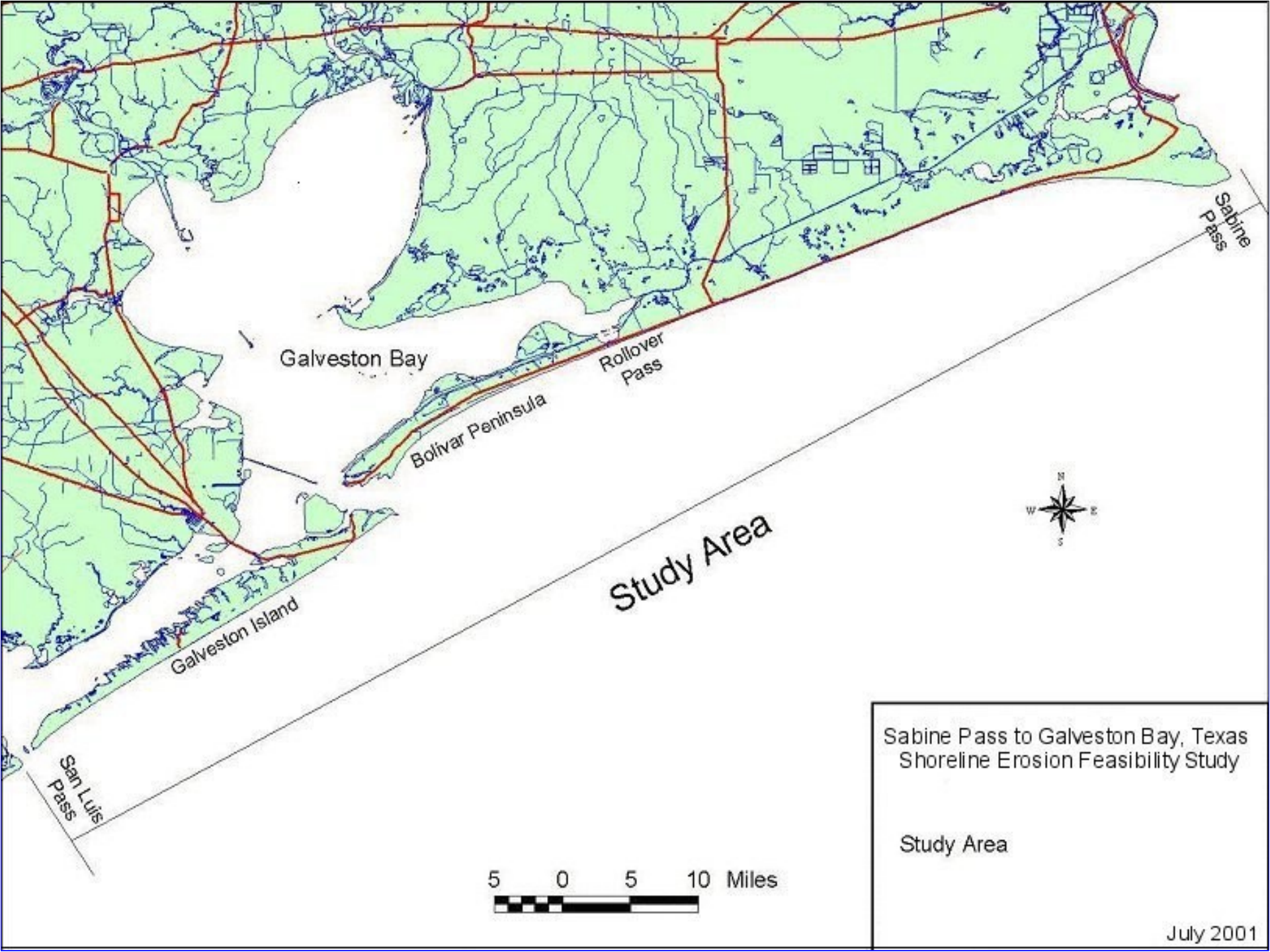
## *MsCIP Hypothetical Present-Day Budget*



*(...not “operational”, rather “hypothetical present-day”)*

For MsCIP, we weighted historical budget most heavily, with numerical budget filling in unknown information (mainland)

→ For a truly MsCIP Operational Budget, need to



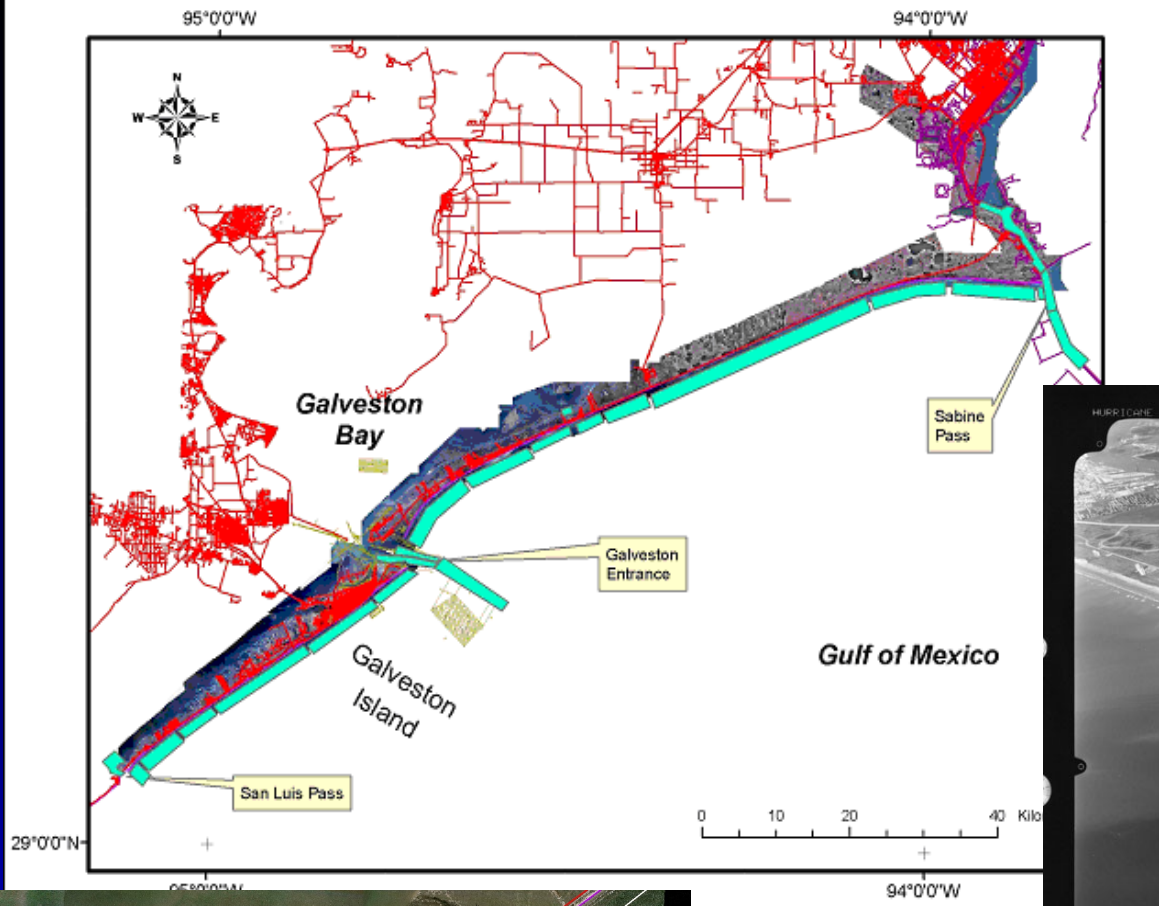
Sabine Pass to Galveston Bay, Texas  
Shoreline Erosion Feasibility Study

Study Area





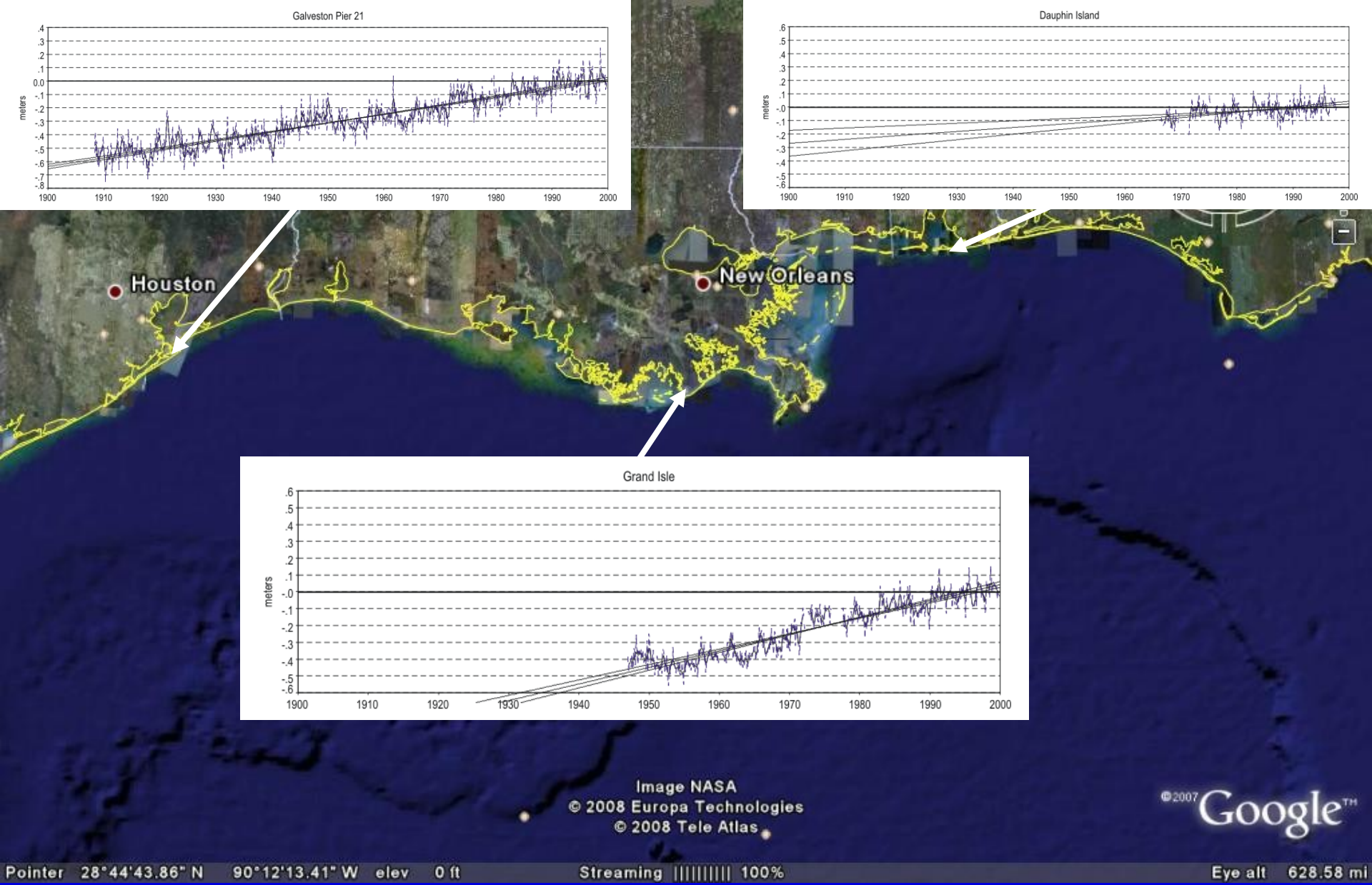




## Galveston Channel South Jetty



## San Luis Pass



# **RSM Benefits**

- Increased knowledge of regional sediment systems - benefits all projects in a region**
- Reintroduction of sediment into littoral systems - reduce erosion, habitat restoration, marsh creation**
- Cost savings - reduced re-handling of material; extended dredging cycles; equipment sharing between projects**
- Shared regional-scale data management systems - shared accessible information, avoid duplication of data collection**
- Improved interagency and stakeholder relationships - generate opportunities for leveraging financial and other resources**



# **The Gulf of Mexico Alliance:**

## **Implementing the U.S. Ocean Action Plan in the Gulf of Mexico**



## **Gulf Regional Sediment Management Master Plan**

**Science Assessment Workshop, St Pete, FL**

- 1. Sediment Inventory - Sediment Resource Assessment (Mapping, Volume, Physical Properties, Extractability, Etc.)**
- 2. Sediment Budget - Sediment Transport Dynamics, Sediment Sources and Sinks, Sediment Transport**

# Questions?

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Email: [jeffrey.p.waters@us.army.mil](mailto:jeffrey.p.waters@us.army.mil)

Website: [www.wes.army.mil/rsm/](http://www.wes.army.mil/rsm/)



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